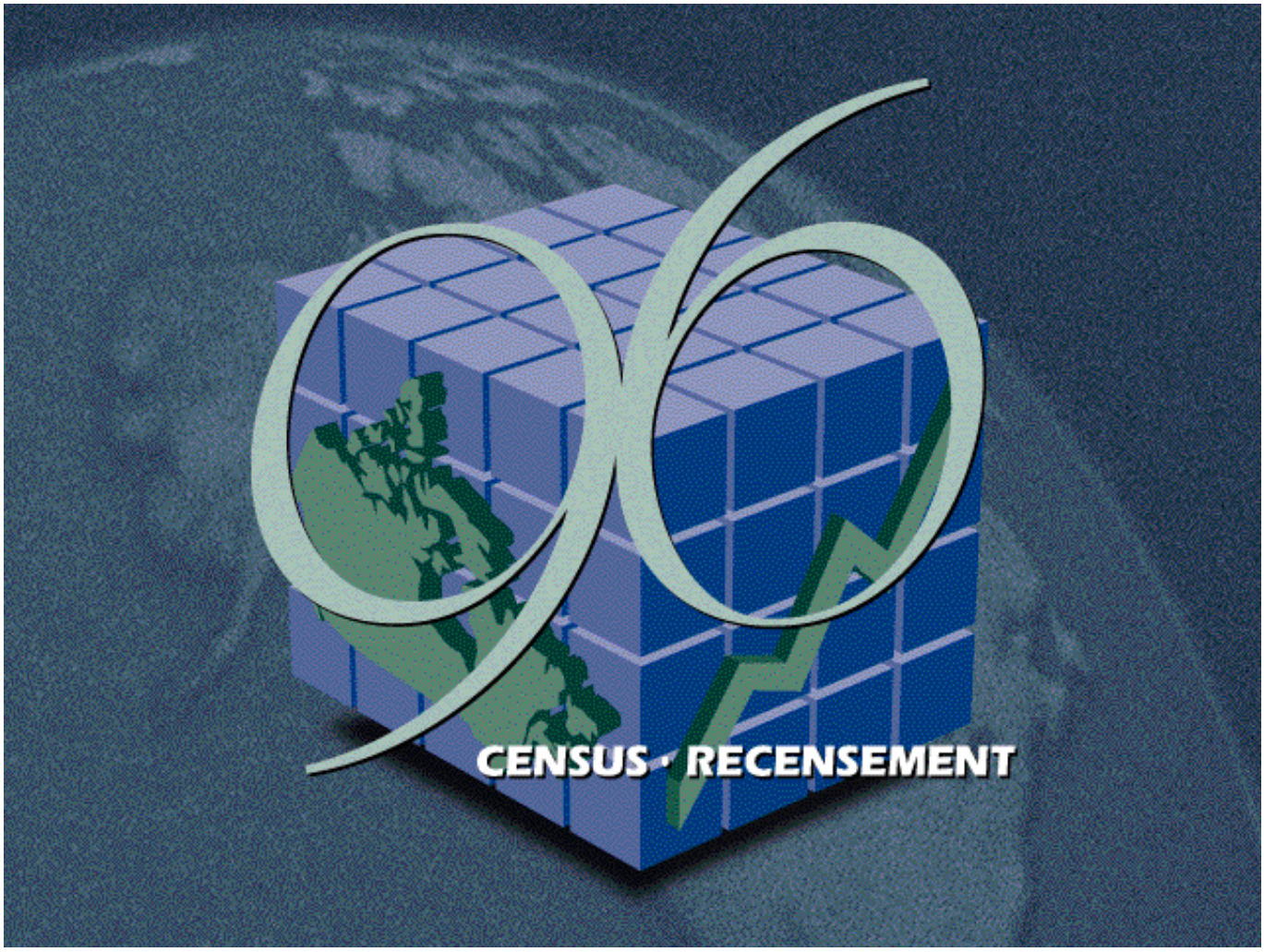
Catalogue No. 92F0085XCB

GeoRef User's Guide

1996 Census - Reference Products



Statistics Canada Statistique Canada

Canada

Data in many forms

Statistics Canada disseminates data in a variety of forms. In addition to publications, both standard and special tabulations are offered. Data are available on the Internet, compact disc, diskette, computer printouts, microfiche and microfilm, and magnetic tape. Maps and other geographic materials are available for some types of data.

How to obtain more information

For any questions about the data or software, please call our toll free StatsCan Electronic Products Help Line at **1 800 949-9491**. Fax: **613-951-5520**.

For information about other products or services, call the national inquiries line at: **1 800 263-1136**

National telecommunications device for the hearing impaired: **1 800 363-7629**

Order-only line (Canada and United States): **1 800 267-6677**

You can also visit our World Wide Web site: **http://www.statcan.ca**

Standards of service to the public

To maintain quality service to the public, Statistics Canada follows established standards covering statistical products and services, delivery of statistical information, cost-recovered services and services to respondents. To obtain a copy of these service standards, please contact your nearest Statistics Canada Regional Reference Centre.

Statistics Canada

GeoRef User's Guide

1996 Census - Reference Products

Published by authority of the Minister
responsible for Statistics Canada

©Minister of Industry, 1997

All rights reserved. No part of this product may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission from Licence Services, Marketing Division, Statistics Canada, Ottawa, Ontario, Canada K1A 0T6.

April 1997

Price: $60.00
United States: US$60.00
Other Countries: US$60.00

User's Guide for Catalogue No. 92F0085XCB
ISBN 0-660-59272-X

Ottawa

Note of appreciation

Canada owes the success of its statistical system to a long-standing co-operation involving Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

TABLE OF CONTENTS

Page

1. About this Guide 1

2. Overview 2

2.1. Introduction 2
2.2. Reference Date 2

3. Getting Started 4

3.1. Name Search 4
3.1.1. Step 1 of 4: Name Search 4
3.1.2. Step 2 of 4: Select Lower Geographic Level 5
3.1.3. Step 3 of 4: Select Data 5
3.1.4. Step 4 of 4: View Data 5
3.2. Code Search 5
3.2.1. Step 1 of 4: Code Search 6
3.2.2. Step 2 of 4: Select Lower Geographic Level 6
3.2.3. Step 3 of 4: Select Data 6
3.2.4. Step 4 of 4: View Data 6
3.3. Chart Search 6
3.4. Reports 7
3.5. Load Query 7
3.6. Quit 8
3.7. Sample Sessions 8
3.7.1. Searching for geographic areas and their data values 8
3.7.2. Browsing data using the Chart Search function 8
3.7.3. Creating an Excel™ file of population for a CMA by CSDs 9
3.7.4. Creating a list of the FEDs for a Cross Provincial CMA/CA 10

4. Data Quality 11

4.1. Lineage 11
4.1.1. Geographic Areas, their Names and their Types 11
4.1.2. Codes and Unique Identifiers 13
4.1.3. 1996 Census Population and 1996 Census Private Occupied Dwellings 13
4.1.4. 1996 Census Land Area 14
4.1.5. 1991 Census Population by 1991 Census Boundaries 14
4.1.6. 1991 Census Population by 1996 Census Boundaries and the Adjusted Population Flag 15
4.1.7. Incompletely Enumerated Indian Reserve Flag for 1996 and 1991 15
4.1.8. Positional Data 16
4.1.9. Tracted 16
4.1.10. Enumeration Area Urban/Rural Status 16
4.1.11. Comment 17
4.1.12. Street Network Flag 17
4.1.13. EA Reference Map Lists 17

TABLE OF CONTENTS - concluded

Page

4.1.14. Reports 17
4.1.15. Secondary Province Code....17
4.1.16. Enumeration Area Correspondence 17
4.2. Positional Accuracy....18
4.3. Attribute Accuracy....18
4.3.1. Name Search, Code Search and Chart Search 18
4.3.2. Reports....19
4.4. Logical Consistency....19
4.4.1. Internal Consistency....19
4.4.2. 1996 Census Land Area....20
4.4.3. Population and Dwelling Counts Data....20
4.4.4. Hierarchy of Geographic Areas in the Chart Search Section....20
4.4.5. Consistency with other Products....21
4.5. Completeness....21
4.5.1. Population and Dwelling Counts....22
4.5.2. CSD Type....22
4.5.3. EA Comments....22
4.5.4. Reference Maps....22

5. Technical Specifications....24

5.1. System Requirements....24
5.2. Installation of *GeoRef*....24
5.3. Installation of Adobe™ Acrobat™ Reader v2.1 25

Appendix A. Data Quality of the 1996 Census....26

Appendix B. Geographic Units by Province and Territory, 1996 (as of November 1996) 31

Appendix C. Census Subdivision Types by Province and Territory, 1996....32

References....33

Limited Use Data Product Licence Agreement....34

1. About this Guide

This User's Guide provides an overview of the *GeoRef* CD-ROM product, including the general methodology used to create it.

The **Overview** section provides a summary of the data contents and the reference date of the product.

The **Getting Started** section describes the main menu of *GeoRef* and provides explanations on the various functions of the program. It also includes four sample sessions with step-by-step examples of how to do different kinds of data requests.

Section 4, **Data Quality**, provides information for users to evaluate the suitability of the data for a particular application.

Installation instructions are provided in section 5, **Technical Specifications**.

Supplementary information is provided in the appendices.

This user's guide is based on the best information available at the time of release. It does not constitute a warranty of the data in the event that users may observe characteristics that deviate from those stated in this guide. All efforts have been made to ensure that the verification of this product has been thoroughly done. However, there is no guaranty that the data are 100% accurate. For further information, see Section 4, **Data Quality**.

2. Overview

2.1. Introduction

GeoRef is a powerful search tool based on the 1996 Census geographic reference information and includes population and dwelling count data for all standard geographic areas. With *GeoRef*, users may retrieve data, explore the links between geographic areas and obtain information on those areas. The information available includes 1996 population counts, 1996 dwelling counts, land area (except for federal electoral districts and enumeration areas), geographic codes, names and, in some cases, 1991 Census population counts (both final and adjusted) for growth calculations.

This version of *GeoRef* contains data for the following standard Census and geographic units:

- Canada (CAN)
- Provinces/Territories (PR)
- Economic Regions (ER)
- Census Divisions (CD)
- Census Consolidated Subdivisions (CCS)
- Census Subdivisions (CSD)
- Designated Places (DPL), (the CSD parts of DPLs)
- Federal Electoral Districts (FED), (based on the 1987 Representation Order)
- Census Metropolitan Areas/Census Agglomerations (CMA/CA)
- Primary Census Metropolitan Areas/Primary Census Agglomerations (PCMA/PCA)
- Census Tracts (CT)
- Urban Areas (UA)
- Enumeration Areas (EA)

GeoRef also provides access to the following information:

- EA Correspondence data that relate the 1991 Census enumeration areas to the 1996 Census enumeration areas;

- EA Reference Map listing that enables users to get reference numbers for EA maps covering any standard geographic area; and

- a series of reports, including EA Reference Lists which were available as separate publications for the 1991 Census. These reports can be viewed on screen or printed.

2.2. Reference Date

The population and dwelling counts are generated from the 1996 Census of Population and Housing which was conducted on May 14, 1996.

The geographic reference date for the 1996 Census is **January 1, 1996**. Names, boundaries and other attributes of geographic areas change frequently (for example, municipal amalgamations, annexations, name and status changes). Since the geographic framework is used for census data collection, the geographic reference date must be set sufficiently in advance of Census Day to permit all changes to be processed in time. Furthermore, notification of these changes is normally not received from the applicable federal and provincial authorities until after the changes have

occurred. For these reasons, the census reports data according to the geographic areas that were in effect on January 1, 1996, provided the information on the changes was received by Statistics Canada by March 1, 1996.

Since census data refer to conditions as they existed on Census Day (May 14, 1996), and the geographic framework is established according to the geographic areas in effect as of January 1, 1996, census data may be reported for geographic areas which have subsequently changed during this period.

3. Getting Started

When you install *GeoRef* (see section 5.2), by default a 'Census - 96 - Recensement' program group is created. The *GeoRef* icon is located in this program group. Double-clicking on this icon will launch the *GeoRef* program. The first screen to appear will be the Statistics Canada logo followed by a language selection. Choose the language of preference. A licence agreement screen appears next with a choice of accepting the conditions of the licence agreement or not If you click on the **Accept** button, you will proceed to the *GeoRef* **Main Menu** screen. If you click on the **Do not Accept** button, you will automatically exit from the system.

On the **Main Menu** screen, there are six functions available: **Name Search**, **Code Search**, **Chart Search**, **Reports**, **Load Query** and **Quit**. These functions are described in detail in the following sections and the Windows™ Help.

There are Windows™ Help files found in the software. You can access the **Help** from the **Menu Bar** or the **Toolbar**. If you would like to get information on a particular topic, go into the **Help** menu in the **Menu Bar** and select either **Contents** or **Search for Help on...** to display a list of available help topics. If you would like help on the screen that you are in, then click on the **Help** button in the **Toolbar** to display the help topic for that screen.

3.1. Name Search

The **Name Search** function allows you to search for a geographic name or area and to retrieve data on the area. There are four steps in this process.

Step 1: Select an area (for example, a specific province, place name, or even all of Canada).

Step 2: Select the lower geographic level where you expect to find the information you need (for example, place names in the province, or provinces in the country).

Step 3: Select the data set you wish to view by selecting the fields and sort order and adding any conditions on the data.

Step 4: View, print or export the results of your search, perform calculations or save your query.

3.1.1. Step 1 of 4: Name Search

Upon entering the this screen, your cursor is in the **Enter Name** field. You may type in all, some, or none of the letters of the desired name, then press the tab key to move below to the **List Panel**.

You may want to use the **Level** list to view only the names of a particular geographic type. To do this, pull down the list on the right. By default, all of the names in Canada are displayed.

The data for the name selected in the list panel are displayed in the three data information panels. Users can toggle between the panels by clicking on the three tabs: **1996 Census Info**, **Geographic Levels**, and **1991 Census Info**.

The data for the selected geographic area may be printed using either the **Print** command on the **Menu Bar**, or the **Print** button on the **Toolbar** at the top of the screen.

You may then press **Next** to go to the next screen or **Back** to go back to the **Main Menu**.

When the 'CT (Census Tract)' level is selected from the **Level** pull down list, a **Select CMA/CA** button appears. This button allows you to narrow your search and view only the CTs in a specific CMA/CA.

3.1.2. Step 2 of 4: Select Lower Geographic Level

All of the choices available for the place selected in Step 1 are displayed and you must choose one level of geographic data that you want to view.

Not every selection will bring up data. There may or may not be data present for the levels and the area you selected in the previous screen.

3.1.3. Step 3 of 4: Select Data

In this screen you select fields to output for the chosen area and the level of geographic data you wish to view. Note, you can select fields from a higher geographic level by clicking on the **Select fields** from table pull down list.

For instructions on how to move items from one list to the other, see **Using Selection Lists** in the Windows Help files.

Click on the **Set Sort Order** button to sort the data in a particular order.

Click on the **Set Condition** button to add conditions and view a subset that matches the conditions.

Click on the **No Duplicate** option to eliminate duplicate records in the data you select to view. For more information on the **No Duplicate** option, see Sample Session 3.7.4.

The last step is to click on the **Next** button to run the query and display your data in the **View Data** window.

You must have entered at least one item in the **Selected Fields** list in order to set a sort order or to access the next screen.

3.1.4. Step 4 of 4: View Data

Once you have selected the data fields for the area and level of geography, this step will allow you to view, print or export the results of your search, perform calculations or save your query.

You can also use the **Back** button to retrace your steps through the search and repeat the search using a different geographic area or altering the fields or conditions.

You can change the size of columns by using the mouse to grab the line between columns. A symbol with two arrows will appear. Drag the symbol to enlarge or shrink the columns.

3.2. Code Search

Geographic codes are created by Statistics Canada to identify geographic entities. They are an alternative to searching for data by name. The **Code Search** function allows you to search for a geographic code and retrieve data on the area. You can then search for information on lower geographic levels within a geographic area. There are four steps in this process. The last 3 steps are identical to a **Name Search**.

Step 1: Select a code (for example, a specific province code, place name code, or even all of Canada).

Step 2: Select the lower geographic level where you expect to find the information you need (for example, place names in the province, or provinces in the country).

Step 3: Determine the data set you wish to view, by selecting the fields, sort order, and adding any conditions on the data.

Step 4: View, print, or export the results of your search, perform calculations or save your query.

3.2.1. Step 1 of 4: Code Search

Upon entering the screen, your cursor is in the **Enter Code** field. You may type in all, some, or none of the numbers of the desired code, then press the tab key to move below to the **List Panel**.

Refer to 3.1.1 for a description of Step 1 of 4.

3.2.2. Step 2 of 4: Select Lower Geographic Level

Refer to 3.1.2 for a description of Step 2 of 4.

3.2.3. Step 3 of 4: Select Data

Refer to 3.1.3 for a description of Step 3 of 4.

3.2.4. Step 4 of 4: View Data

Refer to 3.1.4 for a description of Step 4 of 4.

3.3. Chart Search

The **Chart Search** function allows you to select and view data using a chart view that represents the geographic hierarchy.

To view data for a certain geographic level, click on the acronym button that corresponds to it. For example, FED represents federal electoral district. Clicking the **FED** button will display a list of federal electoral districts and columns of data about them in the **Geography Data** window.

You can choose more than one geographic level. Each additional level you choose adds a page to the **Geography Data** window. To view other pages, you need to click on the appropriate tab.

When you make a selection by clicking on a geographic level, only the geographic levels that are on the same path will stay enabled. The other choices are dimmed to show they are disabled.

When more than one geographic level is selected, the data in the lower level will be a subset of the units for the currently selected unit in the higher level.

You can remove levels from the **Geography Data** window by clicking on the appropriate button on the chart again.

There are two ways to toggle between the **Chart Search** screen and the **Data Display** window. You can click any part of the screen you want to see. This will bring it to the front. You can also use the toggle button to display whichever window is not in front.

You can change the size of columns by using the mouse to grab the line between columns. A symbol with two arrows will appear. Drag the symbol to enlarge or shrink the columns.

You can also re-position and change the order of columns by clicking and dragging a column heading to another part of the display window.

You can also click on the small black box in the lower left-hand corner of the data page and drag to the right to split the chart. This is useful to keep the codes or names to the left while scrolling through the fields to the right.

3.4. Reports

This function displays a list of five standard, frequently requested reports based on 1996 Census data. These reports were formerly print publications of Statistics Canada.

There are five different reports available:

- CMA/CA: EA Reference List by CT
  - a list of CMAs/CAs that contain census tracts is displayed
- CMA/CA: EA Reference List by CSD
  - all CMAs/CAs are available
- CD: EA Reference List by CSD
  - all CDs are displayed with their codes to differentiate those with the same name
- FED: CSD Reference List
  - all FEDs are listed
- CSD: CT Reference List
  - all CSDs in a CMA/CA are listed, but not all will contain census tracts.

Select the report you want by clicking the appropriate button.

Click on the **Select Area** button to choose the geographic area for your report.

Reports may then be printed or viewed on screen. You cannot export the reports to other applications through this window.

3.5. Load Query

A saved query is created by completing a **Name Search** or **Code Search** through the program data, then saving the steps you used by clicking the **Save Query** button in the **View Data** screen. Saved queries allow users to carry out identical searches through *GeoRef*, but using different fields.

To load a query you created in an earlier search, select its name and description and click OK. This will open the **Select Data** screen and allow you to revise or re-enter field selections, sort order and conditions. Clicking the **Back** button at this point will return you to the **Load Query** screen. Once you have clicked the **Next** button, the **Back** button may then be used to return to Step 1.

You may delete queries you no longer want to save and recall any you may have just accidentally deleted.

3.6. Quit

This function allows you to exit *GeoRef*. The next screen will ask you to confirm your intentions to exit *GeoRef*.

3.7. Sample Sessions

The steps for four sample data requests are detailed below. These sample sessions have been designed to give an overview of the most useful functions of *GeoRef* and to review difficult selections for novice users.

3.7.1. Searching for geographic areas and their data values

In this sample session, you will be searching for the Lambert coordinates of three EAs - 24002001, 24002010, and 35001010.

1. From the **Main Menu**, click the **Code Search** button.

2. Click on the **Level** drop-down list, which initially contains 'All'.

3. From the list that appears, scroll down until you can see 'EA (Enumeration Area)', and click on the entry.

4. The cursor will now be in the text box at the top of the screen. Type in the EA Code for the first EA on which you need information, 24002001. The list below displays the EAs in numerical order.

5. Once you stop typing, the information for that EA is displayed in the tabs in the bottom half of the screen. Clicking on each **Panel** brings it forward, so you can see the information grouped on it.

6. Note the Lambert coordinates on paper, or print the information using the **Print** button on the toolbar at the top of the screen, or use the **Print** option from the **File Menu**.

7. Use the scroll bar on the list of codes, or the down arrow key, to scroll down to the next record, 24002010.

8. To view the information on the final EA, double-click in the **Enter Code** text box at the top of the screen. This will shade the numbers you typed in previously, so they will be overwritten when you start to type in the next code. Type in 35001010.

3.7.2. Browsing data using the Chart Search function

In this sample session, you will be using the **Chart Search** function to browse FEDs in Ontario**.**

1. From the **Main Menu**, click the **Chart Search** button.

2. In the **Chart** window, click on the **PROV/TERR** button. This opens the data panel in the **Geographic Data** window, listing all of the provinces.

3. In the Chart, click on the **FED** button. This opens a 'FED' data tab behind the tab labelled 'PR'.

4. In the **Geographic Data** window, click in the record for Ontario to select it. Now click on the **FED** tab. The table contains each of the FEDs in Ontario. Use the scroll bar at the bottom of the data to reveal the rest of the fields. Use the scroll bar at the side of the data to move down through the rest of the records.

3.7.3. Creating an Excel™ file of population for a CMA by CSDs

In this sample session, you will be creating an Excel file with CSDs of the type 'City' and their 1996 population in the CMA of Toronto, ordered by name.

1. From the **Main Menu**, click the **Name Search** button.
2. In the text box at the top of the screen, type in 'Toronto'.
3. Hit the tab key to move to the list of names.
4. Hit the down arrow to scroll through the **Level** column and select the only Toronto entry which is a CMA/CA.
5. Click on the **Next** button to move to Step 2 of 4.
6. Click on 'CSD (Census Subdivision)' in the list of Geographic levels.
7. Click on the **Next** button to move to Step 3 of 4.
8. In the **Available Fields** list, double-click on 'CSDname'. It should appear in the **Selected Fields** list. Now use the scroll bars on the **Available Fields** list until 'CSDpop96' appears, then double-click on it.
9. Click on the **Set Sort Order** button.
10. Double-click on 'CSD Name' in the **Selected Fields** window. It should appear in the **Sort By** list.
11. Click on the **OK** button to close this screen.
12. Click on the **Set Condition** button.
13. Click on the drop-down list in the **Field** column and select CSDtype from the list.
14. Click on the drop-down list in the **Criterion** column, and select 'Equals'.
15. Click in the **Value** column, and then click on the **Select from List** button**.**
16. Double-click in the row with 'C' in the **Type** column and 'City - Cité' in the **Description** column to select that value.
17. Click on the **OK** button to close this screen.
18. Click on the **Next** button to see the data.
19. Click on the **Export** button on the **Toolbar**, or select the **Export** option from the **Tools** menu.

20. Enter the file name to save the data. Use the **Browse** button to select a directory path or a filename that already exists.

21. Click in the **Type** drop-down list, and select the appropriate Microsoft™ Excel™ entry.

22. Click on the **OK** button to complete the export. The data file can now be opened from within Excel.

3.7.4. Creating a list of the FEDs for a Cross Provincial CMA/CA

In this sample session, you will be creating a list of the FEDs (federal electoral districts) either partly or completely in the Ottawa - Hull CMA (census metropolitan area).

1. Select **Name Search** from the *GeoRef* **Main Menu**.

2. The cursor will now be in the text box at the top of the screen. Type in the name Ottawa - Hull, for the CMA/CA on which you need information. The list below displays the CMAs/CAs in alphabetical order.

3. More than one Ottawa - Hull will appear in the list. Scroll to the Ottawa - Hull which is identified as a CMA/CA in the **Level** column. Click **Next**.

4. Select EA (Enumeration Area) from the display window of lower geography levels. Click **Next**.

5. From the **Select fields** from table list, choose FED (federal electoral district).

6. From the **Available Fields** list, choose FEDname.

7. Click **No Duplicates** to eliminate duplicate records in the output data. Click **Next**. (Federal electoral districts contain many enumeration areas. Choosing **No Duplicates** assures that FED names will appear only once in the data output.)

8. A list of FEDs in the Ottawa - Hull CMA appears in the data output window.

4. Data Quality

The purpose of this data quality statement is to provide detailed information so that users may evaluate the suitability of the data for their use. Five fundamental components of a data quality statement are: lineage, positional accuracy, attribute accuracy, logical consistency and completeness. (See Statistics Canada, 1992.)

The 1996 *GeoRef* is a data base containing 1996 Census population and dwelling count data by geographic area. The 1996 population and private occupied dwelling counts and related data are provided for standard geographic areas (see section 4.1 Lineage).

Data by the standard geographic areas are available in **Name Search**, **Code Search** and **Chart Search** options from the **Main Menu** in *GeoRef* (refer to section 2.1). The user can also search in **Name Search** and **Code Search** by place names (PNs). Place names are not a standard geographic area and no census data are available for these. However, in **Name Search** and **Code Search**, data are provided for the census subdivision to which the Place Name is linked.

For the 1996 Census, designated places have been added to the geographic hierarchy and provincial census tracts have been removed. Prior to 1996, economic regions were called subprovincial regions.

In addition to the 1996 census data, EA Reference Map Lists, EA Correspondence File and **Reports** (see section 3.4) are provided.

Most of the 1996 Census data in *GeoRef* have been directly extracted from the 1996 Query - Geographic Attribute Data Base (Q-GADB), a database maintained within Statistics Canada. Therefore, the quality of the data obtained by querying *GeoRef* results from the quality of the Q-GADB, the extraction/derivation process and the *GeoRef* software.

4.1. Lineage

Lineage includes descriptions of the source material from which the data were derived and the methods of derivation.

All data in *GeoRef*, excluding the reference map lists were originally extracted from the Q-GADB. The extraction from this data base was done on February 4, 1997. The EA Reference Map Lists were compiled during the production of the reference maps for the 1996 Census.

Pertinent information about the methods used in the production of the data in *GeoRef* is provided below. For brevity, the lineage is described in terms of the various types of attribute information found in the data base.

4.1.1. Geographic Areas, their Names and their Types

Statistics Canada disseminates census data by standard geographic areas. These areas are either administrative or statistical.

Administrative areas are defined, with a few exceptions, by federal and provincial statutes. These include:

Canada (CAN);
Provinces and territories (PR);
Federal electoral districts (FEDs), (1987 Representation Order);

Census divisions (CDs);
Census subdivisions(CSDs);
Designated places (DPLs), (only CSD parts of DPLs).

Statistical areas are defined by Statistics Canada as part of the spatial frame used to collect and disseminate census data. These include:

Economic regions (ERs);
Census consolidated subdivisions (CCSs);
Census metropolitan areas (CMAs);
Census agglomerations (CAs);
Primary census metropolitan areas (PCMAs);
Primary census agglomerations (PCAs);
Census Tracts (CTs);
Urban areas (UAs);
Enumeration Areas (EAs).

Geographic name data refer to the names given to standard geographic areas. Geographic names, however, are not given to all standard geographic areas. Named geographic areas include provinces and territories, economic regions, census divisions, census consolidated subdivisions, census subdivisions, census metropolitan areas and census agglomerations, designated places, urban areas and federal electoral districts.

Although census tracts do not have geographic names, they do have numeric names.

For provinces and territories as well as for economic regions, the data base contains both English and French names. The sources used for the names of the provinces and territories are the statutes of the respective provinces and territories. Economic region names have been standardized for 1996.

The source of the geographic names of federal electoral districts is the 1987 Representation Order of the Chief Electoral Office, Elections Canada.

For those census divisions and census subdivisions that respect the administrative fabric within the provinces, the sources of the names (and census subdivision types) were the provincial governments. Statistics Canada receives input from the provincial governments concerning all boundary, name and type changes to their respective municipal structure. The census reflects the administrative structure within provinces that was in effect on the geographic reference date of January 1, 1996[1].

Where no provincial or territorial administrative areas exist, some census divisions and census subdivisions and their associated names (and census subdivision types) are created in consultation with provincial or territorial authorities. The names of Indian reserves and settlements are provided to Statistics Canada by Indian and Northern Affairs Canada.

For census consolidated subdivisions, names are derived from their component census subdivisions. The census consolidated subdivision's name coincides with the name of the largest census subdivision component in terms of land

[1] Due to operational constraints, Statistics Canada enforced a cut off date of March 1, 1996 for the receipt of information concerning changes. This ensured that the changes would be instituted prior to Census Day, May 14 1996.

area.

The census metropolitan area or census agglomeration name is usually based on that of the largest urban centre(s) within the census metropolitan area or census agglomeration.

Place names are not considered part of the standard geography hierarchy. The primary sources of Statistics Canada's place names are:

1. names reported by the census representatives during the past censuses;
2. historical census subdivision records (name changes/dissolutions); and
3. names approved by the provincial and territorial authorities [federally represented by the Canadian Permanent Committee on Geographic Names (CPCGN)].

After the extraction from the Q-GADB, an accent was corrected on a place name. The place name spelled 'Wûrtele' was corrected to 'Würtele' (a 'u' with an umlaut) on *GeoRef*.

Information on the delineation criteria for geographic areas as well as the sources of geographic names is provided in the 1996 Census Dictionary.

4.1.2. Codes and Unique Identifiers

A geographic code is a unique number used to identify and access standard geographic areas for the purpose of data storage, retrieval and display.

The system of geographic codes for provinces and territories, census divisions and census subdivisions is the Standard Geographical Classification (SGC). This classification system is a hierarchical coding system that provides a unique identifier for each level of this hierarchy. This coding system is developed by Statistics Canada and approved by provincial authorities.

For a census consolidated subdivision, the code is derived from the component census subdivisions. The census consolidated subdivision's code coincides with its largest census subdivision component in terms of land area.

The source of the geographic codes of federal electoral districts is the 1987 Representation Order of the Chief Electoral Office, Elections Canada.

All other codes are developed by Statistics Canada.

In *GeoRef*, the unique identifier (uid) is a concatenation of geographic codes that uniquely identify standard geographic areas in Canada. For example, each enumeration area (EA) is assigned a three-digit code that is unique within a federal electoral district (FED). In order to uniquely identify each EA in Canada, the three-digit EA code must be preceded by the two-digit province code (PR) and the three-digit FED code. This concatenated code (PR + FED + EA) is called the EAuid.

The unique identifier is established by Statistics Canada.

4.1.3. 1996 Census Population and 1996 Census Private Occupied Dwellings

The population and dwelling count data were derived from the 1996 Census. Population counts are determined according to the "de jure" method. This means that people are enumerated at their usual place of residence, regardless

of where they may have been on Census Day, May 14, 1996.

The data were collected by census representatives for each enumeration area; the enumeration area counts were then tabulated based on the enumeration area's relationship to higher level geographic areas. Data for the higher level geographic areas reflect the boundaries in effect on January 1, 1996 (the geographic reference date for the census) and the population and dwelling counts as reported by census respondents on Census Day, May 14, 1996.

Refer to section 4.5 Completeness for details on the content of the population and dwelling count data.

See Appendix A for notes on the quality of the 1996 Census data.

4.1.4. 1996 Census Land Area

1996 Census land area refers to the area in square kilometres of the land-based portions of the census geographic areas and excludes discernible bodies of water as found on the maps used to calculate land area. All land areas apply to the boundaries in effect on January 1, 1996, the geographic reference date for the 1996 Census. Land area data were extracted from the Query - Geographic Attribute Data Base.

A digital planimeter is used to measure land area. Measurements are normally taken three times for each geographic unit and then averaged. The map scales generally vary between 1:50,000 and 1:250,000. In very densely populated or sparsely populated regions of Canada, larger or smaller scales may be used. Only discernible bodies of water found on the maps are excluded.

The digital planimeter gives accurate readings only for small zones. Consequently, large geographic units are subdivided into smaller ones and measured individually; the individual parts are then added together.

Geographic areas with boundary changes from one census to another are not measured in their entirety. Only the land area gained or lost due to a boundary revision or update is measured, and then added to or subtracted from the original figure.

Land area measurements for census subdivisions (CSDs) are aggregated to obtain the land areas for other geographic units - namely, primary census metropolitan areas/primary census agglomerations (PCMAs/PCAs), census metropolitan areas/census agglomerations (CMAs/CAs), census consolidated subdivisions (CCSs), census divisions (CDs), economic regions (ERs) and provinces/territories. Land area measurements are done separately for urban areas (UAs), designated places (DPLs) and census tracts (CTs).

Land area data are available for all standard geographic areas in *GeoRef* except enumeration areas (EAs) and federal electoral districts (FEDs).

Land area data are subject to a number of errors, including measurement, coding and transcription, processing and overall, cumulative historic errors. The land area measurements are unofficial and are provided for the sole purpose of calculating population density.

4.1.5. 1991 Census Population by 1991 Census Boundaries

These are the population counts as enumerated in the 1991 Census according to boundaries that were in effect as of January 1, 1991.

These data are provided for all standard geographic areas except EAs and DPLs. (Since designated places are new for

this census, no 1991 Census Population by 1991 Census Boundaries population counts are available.)

Users are cautioned that these data are only provided for reference purposes in cases where the '1991 Census population by 1991 Census boundaries' is not the same as the '1991 Census population by 1996 Census boundaries'. Since data are provided by the 1996 Census boundaries and geographic structure, calculations on data from the 1996 *GeoRef* should only be done using the 1991 data adjusted to the 1996 boundaries. Corrections made to the final 1991 Census data are reflected in the 1991 data adjusted to the 1996 boundaries.

4.1.6. 1991 Census Population by 1996 Census Boundaries and the Adjusted Population Flag

Users wishing to compare the 1996 Census data with those of other censuses should be aware that the boundaries of geographic areas may change from one census to another. In order to facilitate this comparison, the 1991 Census population counts are adjusted as needed to take into account boundary changes between the 1991 and the 1996 Censuses. The 1991 Census Population by 1996 Census Boundaries is also known as the 1991 adjusted population. Where the 1991 adjusted population counts did not equal the 1991 final population counts, the adjusted population flag was set to '1'. Most of these cases are the result of boundary changes; however, the '1' may also refer to corrections to the 1991 population counts which are reflected in the 1991 adjusted population counts.

In the case of census subdivisions, this flag is also set to '1' to identify newly incorporated municipalities (census subdivisions).

Since designated places are new for this census, 1991 population counts data for designated places are considered adjusted.

1991 adjusted population counts are provided for all levels of standard geography except for provinces/territories, federal electoral districts and enumeration areas. No change in boundaries has occurred for provinces and territories or federal electoral districts between the 1991 and 1996 Censuses and therefore adjusted population counts are not applicable.

After the extraction from the Query - Geographic Attribute Data Base, corrections were made to the adjusted population flags for census subdivisions on *GeoRef*.

4.1.7. Incompletely Enumerated Indian Reserve Flag for 1996 and 1991

On some Indian reserves and settlements during the 1991 and/or the 1996 Census, enumeration was not permitted or was interrupted before it could be completed. Moreover, for some Indian reserves and Indian settlements, the quality of the collected data was considered inadequate. These geographic areas are called incompletely enumerated Indian reserves and Indian settlements. For the 1996 Census, there were a total of 77 incompletely enumerated Indian reserves and settlements. For 1991, there were a total of 78 incompletely enumerated Indian reserves and settlements.

Data for the list of enumeration areas in incompletely enumerated Indian reserves and Indian settlements were suppressed. The higher level geographic areas with a component enumeration area on this list were also given an incompletely enumerated Indian reserve flag; these geographic areas were determined by the linkage between enumeration areas and higher level geographic areas. The 1996 Indian reserve refusal flag indicates whether population and dwelling count data were suppressed for that geographic area (or part of it) for the 1996 Census. The 1991 Indian reserve refusal flag indicates whether the population counts were suppressed for that geographic area (or part of it) for the 1991 Census.

4.1.8. Positional Data

GeoRef contains coordinates for enumeration area (EA) representative points. An enumeration area representative point is a single x,y co-ordinate that represents an enumeration area. In *GeoRef* the representative points are available in both Lambert projection and latitude/longitude.

For EAs within Street Network File (SNF) coverage, representative points are computed by an automated method that locates the point roughly in the visual centre of the land-based portion of the EA. If an EA is in multiple parts, the representative point is located, when possible, in the portion with the largest number of occupied private dwellings (based on the 1991 block-face counts). However, in some cases the representative point is located in the EA portion having the largest land area.

For EAs outside SNF coverage, representative points are located by a manual procedure based on a visual inspection of building and/or street patterns on EA reference maps (some of which have topographic base map information). The representative point is located, when possible, within a predominant cluster of buildings and/or streets. If there is no predominant cluster, then the point is located between two or more clusters. In the absence of any cluster, the point is placed at the visual centre of the EA. If an EA is in multiple parts, the point is located in the portion with the largest number of dwellings. The representative point is normally located in the land-based portion of the EA.

4.1.9. Tracted

This field indicates which census metropolitan areas/census agglomerations (CMA/CA) and primary census metropolitan areas/primary census agglomerations (PCMA/PCA) contain census tracts (CTs). A value of ‘1’ in this field indicates that the CMA/CA or PCMA/PCA has census tracts. The value is ‘0’ for CMAs/CAs and PCMAs/PCAs with no census tracts.

The CMA/CA tracted flags were computed at the enumeration area level if the enumeration area was contained in a census tract and in a CMA/CA. The tracted flag was set to ‘1’ for CMA/CAs whose EAs were also part of CTs. Otherwise, the flag was set to ‘0’.

Similarly, the PCMA/PCA tracted flags were computed at the enumeration area level if the enumeration area was contained in a census tract and a PCMA/PCA. The tracted flag was set to ‘1’ for PCMAs/PCAs whose EAs were also part of CTs. Otherwise the flag was set to ‘0’.

4.1.10. Enumeration Area Urban/Rural Status

For enumeration areas (EAs), this code indicates the urban/rural status of EAs inside and outside Census Metropolitan Areas/Census Agglomerations (CMAs/CAs). The code assignment is as follows:

Code	Definition
1	Urban core
2	Urban fringe
3	Rural fringe
4	Urban Area outside CMAs/CAs
5	Rural area outside CMAs/CAs

These codes were calculated at the enumeration area level based on the enumeration areas linkages to urban areas, census subdivisions and CMA/CAs.

4.1.11. Comment

This field contains address information for selected enumeration areas (EAs). An EA may be a single apartment building, large townhouse complex, hospital, jail or a Canadian Armed Forces ship. This information includes the name of the building or complex (if available) and address. Most of these EAs have a single address, although some may have an address range.

Users should be aware that the source of this information is the census representatives, taken at the time of census collection. This information was then standardised during the production of the enumeration area reference maps for census tracts. The information may or may not reflect the current name or address of the building or complex. It is difficult to determine the data quality of this information.

4.1.12. Street Network Flag

This flag designates census subdivisions (CSDs) that are covered by a Street Network File (SNF). In the *GeoRef* tables, a CSDsnf value of '1' indicates that a CSD is covered by a SNF. If the field contains a zero, the CSD is not covered by a SNF.

4.1.13. EA Reference Map Lists

The EA Reference Map Lists were compiled during the production of the enumeration area reference maps for the 1996 Census. The lists were then provided for input to *GeoRef*.

4.1.14. Reports

The reports in *GeoRef* are derived based on the data extracted from the Query - Geographic Attribute Data Base.

4.1.15. Secondary Province Code

The secondary province (XPR) field in **Chart Search** is used to indicate which census metropolitan areas/census agglomerations (CMA/CA), primary census metropolitan areas/primary census agglomerations (PCMA/PCA) and urban areas (UA) cross provincial boundaries. XPR is read in conjunction with the PR (code) field to obtain the names of these provinces. For example, the urban area of Flin Flon crosses Manitoba and Saskatchewan. The PR code shows the code for Manitoba and the XPR code shows the code for Saskatchewan.

In **Name Search** and **Code Search**, the other province is indicated as 'XProv'.

This field is derived based on data in the Query - Geographic Attribute Data Base.

4.1.16. Enumeration Area Correspondence

The Enumeration Area Correspondence (EACorr) file describes the relationship of the 1991 enumeration area (EA) with the 1996 EA. The fields available through choosing EACorr are the enumeration area unique identifier (EAuid), the previous census enumeration area unique identifier (PC_EAuid) and the previous census part flag (EApart91). The EApart91 indicates that the 1991 EA is partially contained within the 1996 EA boundary. Together, these fields allow comparison between the 1991 and 1996 enumeration areas. This EApart91 is '0' if the 1991 EA corresponds to only one 1996 EA and '1' if it corresponds to more than one 1996 EA.

This file was derived by overlaying the 1996 EA Digital Boundary File and a modified version of the 1991 EA Digital Boundary File. The overlay process in ARC/INFO™ was used to determine where the 1991 EAs are contained in or equal to the 1996 EAs and where a 1991 EA corresponds to more than one 1996 EA.

Users should be aware that the EA Correspondence file was produced using a spatial reconstruction of the 1991 Digital Boundary File. The modified 1991 EA Digital Boundary File used is the 1991 EA Digital Boundary File that was modified in consideration to cartographic enhancements made to the 1996 EA Digital Boundary File (fuzzy tolerances of 1 and 2 meters were used to remove extremely small polygons in the overlaid files).

4.2. Positional Accuracy

Positional accuracy is the difference between the "true" position of a feature in the real world and the "estimated" position stored in the digital file or other product.

The only positional data on the 1996 *GeoRef* are the enumeration area representative points. All EA representative points are guaranteed, by an ARC/INFO™ topology check, to fall within the appropriate EA according to the Digital Boundary Files.

4.3. Attribute Accuracy

Attribute accuracy refers to the accuracy of the non-positional information attached to each feature such as feature name and code.

4.3.1. Name Search, Code Search and Chart Search

Samples of all of the data in the **Name Search**, **Code Search** and **Chart Search** were checked against the Query - Geographic Attribute Data Base (Q-GADB). Errors found on the data base in the adjusted population flag at the CSD level and the spelling of a place name were corrected in *GeoRef*.

Errors in the final population and dwelling count data can result from the collection, processing or derivation of the data for higher level geographic areas. Appendix A describes the errors that can result from the collection and processing. Several quality assurance processes were done on the Q-GADB on the derivation of the data for higher level geographic areas. Samples of population and dwelling count data from *GeoRef* were checked against the Q-GADB. No problems were detected in the comparison.

After the data were loaded on Q-GADB, an error was found in the census data which affects two census subdivisions in Quebec: Wemindji, Terre Réservée (TR) and Wemindji, Village Cri (VC). Due to operational constraints, it was not possible to make adjustments to the 1996 Census data for these two census subdivisions. The original and revised population and dwelling counts are as follows:

Wemindji, TR

1996 total population	
originally	0
corrected	1,013
1996 private occupied dwellings	
originally	0
corrected	221

Wemindji, VC
1996 total population
originally 1,013
corrected 0
1996 private occupied dwellings
originally 221
corrected 0

Land area data are subject to a number of errors, including measurement, coding and transcription, processing and overall, cumulative historic errors. The land area measurements are unofficial and are provided for the sole purpose of calculating population density. (Please see Lineage and the Logical Consistency section).

The EA addresses in the EA comment field may conflict with the position of the EAs in the Large Urban Reference Maps.

Numeric fields were exported and checked for accuracy. Data which are displayed as 'blank' in *GeoRef* are exported as zero ('0'). This should be considered when using data from the population and dwelling count fields in *GeoRef*.

Blank fields are displayed for the final 1991 population counts when the final 1991 population counts are the same as the adjusted 1991 population counts. Users are cautioned about this in using the final 1991 population counts (refer to section 4.1 Lineage).

Blank fields are displayed when population and dwelling count data suppressed at the CSD and EA level due to the Indian Reserve Refusals. Since the population counts for Indian Reserve Refusal CSDs are not included in any of the census counts, the zero (blank) population at the CSD and EA level is consistent with the rest of the counts in *GeoRef*. Refer to section 4.5 Completeness for more information on the effect of this suppression.

Name data were also exported and checked for accuracy. Accents were not translated well on data exported to the DBF™ format and then imported in EXCEL™. Accents were translated well on data that was exported directly to EXCEL™.

4.3.2. Reports

The data in the reports section were verified against an independent derivation of samples of each of five types of reports from the Query - Geographic Attribute Data Base. All problems detected were corrected.

4.4. Logical Consistency

Logical consistency is the degree to which features are accurately represented in the data structure and fulfil all the internal requirements of the data structure. In other words, how well elements of the data structure follow the rules imposed on them.

4.4.1. Internal Consistency

Consistency between the data at the various geographic levels was checked in the Query - Geographic Attribute Data Base from which *GeoRef* data were extracted. These included checks to ensure that lower level counts could be summed to obtain higher level counts and checks to ensure that the Indian Reserve Refusal flag was applied in a consistent manner between the geography levels. For example, if the Indian Reserve Refusal Flag was applied at the

CSD level, then the check ensured that the flag was also applied for the Province where the CSD was located. Exceptional cases where the data were inconsistent are documented in the paragraphs below.

4.4.2. 1996 Census Land Area

Land area data are not consistent between geographic levels. The logical consistency among geographic areas for the 1996 land areas was verified by summing the data for various geographic areas to a common geographic level. The land area for census tracts do not sum consistently to the land area for the CMAs/CAs in which they are located. As described in section 4.1 Lineage, land area measurements were done separately for census tracts, designated places and urban areas. Land areas for all other geographic levels were consistent with each other.

4.4.3. Population and Dwelling Counts Data

The 1996 population and dwelling counts and the 1991 Census population by 1996 boundaries were tested to ensure that they could be summed up to a common higher geographic level. There were no errors found.

Users are cautioned against comparing 1996 population count and 1996 dwelling count data because different universes are being compared (refer to section 4.5 Completeness). The dwelling count data exclude data for collective dwellings and include dwellings occupied solely by foreign or temporary residents. The population count data include data for people occupying collective dwellings and exclude foreign and temporary residents. In addition to this, Canadian residents who are overseas at the time of the census are included in the population counts. The difference in the population and dwelling universe results in cases where there are population counts and no dwelling counts or the dwelling counts are higher than the population counts for certain geographic areas.

Users wishing to compare 1996 Census data with those of other censuses should take into account the fact that the boundaries of geographic areas may change from one census to another. In order to facilitate comparison, the 1991 Census population counts are adjusted as needed to take into account boundary changes between the 1991 and 1996 Censuses (refer to section 4.5 Completeness).

A detailed description of intercensal changes made to the geographic areas can be found in the publication entitled Standard Geographical Classification, 1996, Volume I (Catalogue No. 12-571-XPB).

Please note that the final 1991 population counts (the 1991 Census population by 1991 Census boundaries) for various geographic areas cannot be summed to a common higher geographic level. This is because these data are not provided for every geographic unit, and also, some 1991 Census geographic units no longer exist in the 1996 Census geographic structure. They are only shown in *GeoRef* when the adjusted population count is not the same as the 1991 Census population by 1991 Census boundaries.

Users are also advised that when performing calculations (using the **Calculate** button), records with blanks in them for the variable are included in the calculations. The blank fields are simply set to zero in the calculation. For example, the average of a ‘2’ and a blank would result in ‘1’ and not ‘2’.

4.4.4. Hierarchy of Geographic Areas in the Chart Search Section

The *GeoRef* hierarchy shows urban areas (UAs) as parts of provinces. There were five exceptions for the 1996 Census where UAs cross provincial boundaries. These are:

Campbellton (New Brunswick/Quebec)

Flin Flon (Manitoba/Saskatchewan)
Hawkesbury (Quebec/Ontario)
Lloydminster (Saskatchewan/Alberta)
Ottawa - Hull (Quebec/Ontario)

The UA data is shown correctly in *GeoRef*. For example, if a list of the UAs in Manitoba is selected, only the Manitoba portion of the population of Flin Flon will be shown on that list. (If the selection of UAs for a province is done by code then both the province code and the secondary province code should be considered.)

The *GeoRef* hierarchy shows CMAs/CAs as parts of provinces. There were five exceptions for the 1996 Census where CMA/CAs cross provincial boundaries. These are:

Campbellton (New Brunswick/Quebec)
Pembroke (Quebec/Ontario)
Hawkesbury (Quebec/Ontario)
Lloydminster (Saskatchewan/Alberta)
Ottawa - Hull (Quebec/Ontario)

The CMA/CA data are shown correctly in *GeoRef*. For example, if a list of the CMA/CAs in New Brunswick is selected, only the New Brunswick portion of the population of Campbellton will be shown on that list. (If the selection of CMA/CAs for a province is done by code then both the province code and the secondary province code should be considered.)

GeoRef shows the CSD parts of designated places (DPLs) and this is consistent with the hierarchy shown in **Chart Search**.

4.4.5. Consistency with other Products

GeoRef refers to the census subdivision parts of designated places as 'Designated Places'. This is inconsistent with other products such as the Digital Boundary Files and the Digital Cartographic Files. In these products, whole designated places are referred to as 'Designated Places'.

The population and dwelling counts in *GeoRef* are consistent with those shown in the publication 'A National Overview' (Catalogue No. 93-357-XPB). The '1991 Census Population by 1996 Boundaries' in *GeoRef* is called '1991 Population' in the publication.

4.5. Completeness

Completeness expresses the degree to which the geographic entities (features) are captured according to the data capture specifications. It also contains information about selection criteria, definitions used and other relevant mapping rules.

Appendix B indicates the number of geographic units by province and territory. These numbers were checked on the *GeoRef* files. *GeoRef* contains the correct number of geographic areas.

The completeness of the specific data in *GeoRef* is provided below.

4.5.1. Population and Dwelling Counts

The 1996 Census population counts for a particular area represent the number of Canadians whose usual place of residence is in that area, regardless of where they happened to be on Census Day. Also included are any Canadians staying in a dwelling in that area on Census Day and having no usual place of residence elsewhere in Canada, as well as those considered “non-permanent residents” (see the Special Notes in Appendix A). In most areas, there is little difference between the number of usual residents and the number of people staying in the area on Census Day. For certain places, however, such as tourist or vacation areas, or those including large work camps, the number of people staying in the area at any particular time could significantly exceed the number of usual residents shown here. The population counts include Canadians living in other countries, but do not include foreign residents living in Canada (the "foreign residents" category does not include "non-permanent residents" - see the Special Notes in Appendix A). Given these differences, users are advised not to interpret population counts as being the number of people living in the reported dwellings.

Unlike previous censuses, the Temporary Residents Study was not carried out in 1996. Therefore, the census did not verify, on a sample basis, if temporary residents (persons found on Census Day at a place other than their usual place of residence) were enumerated at their usual place of residence (see the Special Notes in Appendix A).

The dwelling counts in *GeoRef* refer to all private dwellings in Canada occupied by their usual residents, as well as temporary or foreign residents. The dwelling counts do not include collective dwellings. These are dwellings of a commercial, institutional or communal nature. The population in collective dwellings is, however, included in the population counts.

Some Indian settlements and Indian reserves were incompletely enumerated during the 1991 and/or 1996 Censuses (see the Special Notes in Appendix A). These reserves and settlements are identified wherever they appear in *GeoRef* with the 1991 and/or 1996 Indian Reserve Refusal flag as appropriate.

The 1996 population and dwelling counts of any enumeration area or census subdivision with a 1996 incompletely enumerated Indian reserve flag, appears as a blank. The 1991 population of census subdivision with a 1991 incompletely enumerated Indian reserve flag appears as a blank.

Because of the missing data, users are cautioned that for the affected geographic areas, comparisons (e.g. percentage change) between 1991 and 1996 are not exact. While for higher level geographic areas (Canada, provinces, census metropolitan areas and census agglomerations) the impact of the missing data is very small, the impact can be significant for smaller areas where the affected reserves and settlements account for a higher proportion of the population.

4.5.2. CSD Type

Appendix C indicates the number of census subdivision types by province and territory. These numbers were checked on the *GeoRef* files. *GeoRef* contains the correct number of the census subdivision types.

4.5.3. EA Comments

The EA comment field is only available in *GeoRef* for selected EAs that are contained in census tracts.

4.5.4. Reference Maps

The map scale is not available for the Large Urban Enumeration Area Reference Maps since these maps were

produced on 11” by 17” paper based on ‘best fit’ criteria. For the other enumeration area reference maps, the scale is provided wherever it was available. Some of these other maps depict rural areas and the source material for these maps may not have had a scale.

5. Technical Specifications

5.1. System Requirements

GeoRef requires the following minimum system requirements:

486 33 MHz or higher processor

12 MB RAM

VGA or higher-resolution monitor

CD-ROM drive

Mouse or compatible pointing device

Microsoft® Windows™ version 3.x, or Windows™ NT or Windows™ 95

Recommended system requirements are:

486 66 MHz or higher processor

16 MB RAM

six-speed CD-ROM drive

5.2. Installation of *GeoRef*

GeoRef requires approximately 45 MB of disk space to install both the software and data. It can be installed on computers running Windows™ 3.X, Windows™ 95, or Windows™ NT. In Windows™ 3.X, at least a 10 MB swap file is required by the Win32s subsystem.

Note: It is strongly recommended that you close all running applications before installing *GeoRef*. For Windows™ NT, you must be logged onto the system as the system administrator.

1. Insert the CD-ROM into the CD-ROM drive.

2. **For Windows™ 3.X or Windows™ NT3.51:** In the Program Manager, select **Run** from the **File** menu. **For Windows™ 95/Windows™ NT4.0:** Select **Run** from the **Start** menu.

3. Type **x:\setup_g.exe**, where ***x*** is the letter representing your CD-ROM drive. Then, click the **OK** button.

4. Choose the language for the installation instructions. The language preference is for the installation instructions **only**. *GeoRef* is a bilingual product and will prompt you to choose your language preference each time you run the program.

Note: It is recommended that the installation language preference chosen be the same as your operating system.

5. By default, the option to leave the *GeoRef* data files on the CD/Network Drive is selected. To copy the data onto your hard drive, click on the empty circle to the left of this option and either accept or over-write the default location, or make the appropriate selection from the available lists.

6. To view and print the *GeoRef* User Guide, Adobe™ Acrobat™ Reader software is required. This box will already be checked if Acrobat™ Reader v2.1 is not on your computer. For full Acrobat™ Reader installation instructions, see section **3**.

7. Click on the **Install** button to run the installation program.

8. Follow the instructions on the screen.

9. *GeoRef* Setup will inform you when the installation is complete. Click **OK** to finish the installation procedure.

10. If you selected in **step 5** to have the data copied to your computer, *GeoRef* Setup will copy the data now. You will be informed when the data is copied. Click **OK** and *GeoRef* Setup will now install the User Guide icon. The User Guide will remain on the CD-ROM; an Adobe™ Acrobat™ icon is created which points to that file. *GeoRef* Setup will inform you when the installation procedure is finished and the **Census - 96 - Recensement** program group will open.

11. If you selected in **step 6** to have Acrobat™ Reader v2.1 installed on your computer, then click **OK** to begin installation. For full Acrobat™ Reader installation instructions, see section 4.

12. If you are using Windows™ 3.X, you must reboot your computer when installation of *GeoRef* and/or Acrobat™ Reader is complete.

5.3. Installation of Adobe™ Acrobat™ Reader v2.1

1. Adobe™ Acrobat™ Reader requires approximately 4.2 MB of disk space to be installed. It can be installed on computers running Windows™ 3.X, Windows™ 95, or Windows™ NT.

2. An Adobe™ Acrobat™ Reader Installer license agreement will appear on the screen. Please read the terms of the agreement carefully. Click the **Accept** button to comply with the conditions noted in the agreement and proceed with the installation, or click the **Decline** button to quit Acrobat™ Reader Installer.

3. By default, Acrobat™ Reader Installer will install the program in **C:\ACROREAD**. To install to a different directory/folder, type a new drive and/or directory in the **Target Directory** box. Click **Install** to continue or click Cancel to quit the installation.

4. Follow the instructions on the screen.

5. Acrobat™ Reader Installer will inform you when the installation procedure is finished. Click **OK** and the Adobe™ Acrobat™ program group will open.

Appendix A. Data Quality of the 1996 Census

General

The 1996 Census was a large and complex undertaking and, while considerable effort was taken to ensure high standards throughout all collection and processing operations, the resulting estimates are inevitably subject to a certain degree of error. Users of census data should be aware such error exists, and have some appreciation of its main components, so that they can assess the usefulness of census data for their purposes and the risks involved in basing conclusions or decisions on these data.

Errors can arise at virtually every stage of the census process from the preparation of materials, through the listing of dwellings and data collection to processing. Some errors occur more or less at random, and when the individual responses are aggregated for a sufficiently large group, such errors tend to cancel out. For errors of this nature, the larger the group, the more accurate the corresponding estimate. It is for this reason that users are advised to be cautious when using small estimates. There are some errors, however, which might occur more systematically, and which result in "biased" estimates. Because the bias from such errors is persistent no matter how large the group for which responses are aggregated, and because bias is particularly difficult to measure, systematic errors are a more serious problem for most data users than the random errors referred to previously.

For census data in general, the principal types of error are as follows:

- **coverage errors**, which occur when dwellings and/or individuals are missed, incorrectly included or double counted;

- **non-response errors**, which result when responses cannot be obtained from a small number of households and/or individuals, because of extended absence or some other reason;

- **response errors**, which occur when the respondent, or sometimes the Census Representative, misunderstands a census question, and records an incorrect response;

- **processing errors**, which can occur at various steps including **coding**, when "write-in" responses are transformed into numerical codes; **data capture**, when responses are transferred from the census questionnaire to computer tapes by key-entry operators; and **imputation** when a "valid", but not necessarily correct, response is inserted into a record by the computer to replace missing or "invalid" data ("valid" and "invalid" referring to whether or not the response is consistent with other information on the record);

- **sampling errors**, which apply only to the supplementary questions on the "long form" asked of a one-fifth sample of households, and which arise from the fact that the results for these questions, when weighted up to represent the whole population, inevitably differ somewhat from the results which would have been obtained if these questions had been asked of all households.

The above types of error each have both random and systematic components. Usually, however, the systematic component of sampling error is very small in relation to its random component. For the other non-sampling errors, both random and systematic components may be significant.

Coverage Errors

Coverage errors affect the accuracy of the census counts, that is the sizes of the various census universes: population, families, households and dwellings. While steps have been taken to correct certain identifiable errors, the final counts

are still subject to some degree of error resulting from persons or dwellings being missed, incorrectly included in the census or double counted.

Missed dwellings or persons result in **undercoverage**. Dwellings can be missed because of misunderstanding of enumeration area (EA) boundaries, or because they are not apparent (e.g. unmarked dwellings) or appear uninhabitable. Persons can be missed when their dwelling is missed or is classified as vacant, or when individual household members are omitted from the questionnaire because the respondent misinterprets the instructions on whom to include. Some individuals may be missed because they have no usual residence and did not spend census night in any dwelling.

Dwellings or persons that are incorrectly included or double counted result in **overcoverage**. Overcoverage of dwellings can occur when structures unfit for habitation are listed as dwellings, or when units which do not meet the census definition of a dwelling are listed separately instead of being treated as part of a larger dwelling. Double counting of dwellings also can occur because of ambiguity over EA boundaries. Persons can be double counted because their dwelling is double counted or because the guidelines on whom to include on the questionnaire have been misunderstood. Occasionally, someone who is not in the census population universe, such as a foreign resident or a fictitious person, may, incorrectly, be enumerated in the census. On average, overcoverage is less likely to occur than undercoverage and, as a result, counts of dwellings and persons are likely to be slightly underestimated.

In 1996, three studies are used to measure coverage error. In the Vacancy Check a sample of dwellings listed as vacant was revisited to verify that they were vacant on Census Day. Adjustments have been made to the final census counts for households and persons missed because their dwelling was incorrectly classified as vacant. Despite these adjustments, the final counts are still subject to some undercoverage. Undercoverage tends to be higher for certain segments of the population such as young adult males and recent immigrants. The Reverse Record Check study is used to measure the residual undercoverage for Canada, and each province and territory. The Overcoverage Study is designed to investigate overcoverage errors. The results of the Reverse Record Check and the Overcoverage Study, when taken together, furnish an estimate of net undercoverage.

Other Non-sampling Errors

While coverage errors affect the number of units in the various census universes, other errors affect the characteristics of those units.

Sometimes, it is not possible to obtain a complete response from a household, even though the dwelling was identified as occupied and a questionnaire dropped off. The household members may have been away throughout the census period or, in rare instances, the householder may have refused to complete the form. More frequently, the questionnaire is returned but information is missing for some questions or individuals. Considerable effort is devoted to ensure as complete a response as possible. Census Representatives edit the questionnaires and follow up on missing information. Their work is then checked by both a supervisor and a quality control technician. Despite this, at the end of the collection stage, a small number of responses is still missing. Although missing entries are eliminated during processing by replacing a missing value by the corresponding entry for a "similar" record, there remain some potential **non-response errors**. This is particularly serious if the non-respondents differ in some respects from the respondents, since this procedure will result in **non-response bias**.

Even when a response is obtained, it may not be entirely accurate. The respondent may have misinterpreted the question or may have guessed the answer, especially when answering on behalf of another, possibly absent, household member. Such errors are referred to as **response errors**. While response errors usually arise from inaccurate information provided by respondents, they can also result from mistakes by the Census Representative when

completing certain parts of the questionnaire, such as structural type of dwelling, or when calling back to obtain a missing response.

Some of the questions on the census document require a written response. During processing, these "write-in" entries are given a numeric code. **Coding errors** can occur when the written response is ambiguous, incomplete, difficult to read or when the code list is extensive (e.g. Major Field of Study, Place of Work). A formal Quality Control (QC) operation is used to detect, rectify and reduce coding errors. Within each work-unit, a sample of responses is independently coded a second time. The resolution of discrepancies between the first and second codings determines whether re-coding of the work-unit is necessary. Except for the Industry and Occupation variables, much of the Census coding is now automated, partly in an effort to reduce the extent of coding errors.

The information on the questionnaires is key-entered onto a computer file. Two procedures are used to control the number of **data capture errors**. First, certain edits (such as range checks) are performed as the data are keyed. Second, a sample from each batch of documents is re-keyed and compared with the original entries. Unsatisfactory work is identified and corrected and the remainder of the batch is re-keyed as needed.

Once captured, the data are edited where they undergo a series of computer checks to identify missing or inconsistent responses. These are replaced during the Imputation stage of processing where either a response consistent with the other respondent's data is inferred or a response from a similar donor is substituted. Imputation ensures a complete data base where the data correspond to the census counts and facilitate multivariate analyses. Although imputation may introduce errors, the methods used have been rigorously tested to minimise systematic **imputation errors**.

Various studies are being carried out to evaluate the quality of the responses obtained in the 1996 Census. For each question, response rates and edit failure rates have been calculated. These can be useful in identifying the potential for non-response errors and other types of errors. Also, tabulations from the 1996 Census have been or will be compared with corresponding estimates from previous censuses, from sample surveys (such as the Labour Force Survey) and from various administrative records (such as birth registrations and municipal assessment records). Such comparisons can indicate potential quality problems or at least discrepancies between the sources.

In addition to these aggregate-level comparisons, there are some micro-match studies in progress, in which census responses are compared with another source of information at the individual record level. For certain "stable" characteristics (such as Age, Sex, Mother Tongue, Place of Birth), the responses obtained in the 1996 Census, for a sample of individuals, are being compared with those for the same individuals in the 1991 Census.

For further information on the quality of census data, contact the Social Survey Methods Division at Statistics Canada, Ottawa, Canada K1A OT6, (613) 951-6934.

Special Notes

Temporary Residents

Unlike previous censuses, the Temporary Residents Study was not carried out in 1996. Therefore, the census did not verify, on a sample basis, if temporary residents (persons found on Census Day at a place other than their usual place

of residence) were enumerated at their usual place of residence. In the 1991 Census, the number of people included as a result of the Temporary Residents Study was as follows (see Catalogue No. 92-341-E, pages 19-26):

Province/Territory	Estimated Total	Standard Error
Canada	92,584	2,307
Newfoundland	2621	344
Prince Edward Island	323	64
Nova Scotia	3,683	517
New Brunswick	2,459	344
Quebec	16,462	985
Ontario	30,920	1,379
Manitoba	4,098	412
Saskatchewan	4,808	452
Alberta	11,092	829
British Columbia	15,330	943
Yukon Territory	345	89
Northwest Territory	443	96

Incompletely Enumerated Indian Reserves and Indian Settlements

On some Indian reserves and Indian settlements in the 1996 Census, enumeration was not permitted, or was interrupted before it could be completed. Moreover, for some Indian reserves and Indian settlements, the quality of the collected data was considered inadequate. These geographic areas (a total of 77) are called incompletely enumerated Indian reserves and Indian settlements.

Data for 1996 are therefore not available for the incompletely enumerated reserves and settlements and are not included in tabulations. Data for geographic areas containing one or more of these reserves and settlements are therefore noted accordingly. Because of the missing data, users are cautioned that for the affected geographic areas, comparisons (e.g., percentage change) between 1991 and 1996 are not exact. While for higher level geographic areas (Canada, provinces, census metropolitan areas and census agglomerations) the impact of the missing data is very small, the impact can be significant for smaller areas, where the affected reserves and settlements account for a higher proportion of the population.

It was possible after the census to obtain population and dwelling counts for the Wendake (Quebec) Indian reserve. These certified counts amount to 1,462 persons and 563 occupied private dwellings. These numbers are not included in the census population and dwelling counts, since they were established after the census using a different methodology.

Non-permanent Residents

In 1991 and 1996, the Census of Population included both permanent and non permanent residents of Canada. Non permanent residents are persons who hold student or employment authorisations, or Minister’s permits or who are refugee claimants.

Prior to 1991, only permanent residents of Canada were included in the census. (The only exception to this occurred in 1941.) Non permanent residents were considered foreign residents and were not enumerated.

Today in Canada, non permanent residents make up a significant segment of the population, especially in several census metropolitan areas. Their presence affects the demand for such government services as health care, schooling, employment programs and language training. In 1991, the census enumerated 223,410 non-permanent residents in Canada, representing slightly less than 1% of the total population. The inclusion of non-permanent residents in the census facilitates comparisons with provincial and territorial statistics (marriages, divorces, births and deaths) which include this population. In addition, this inclusion of non permanent residents brings Canadian practice closer to the UN recommendation that long term residents (persons living in a country for one year or longer) be enumerated in the census.

Total population counts, as well as counts for all variables, are affected by this change in the census universe. Users should be especially careful when comparing data from 1991 or 1996 with data from previous censuses in geographic areas where there is a concentration of non permanent residents. These include the major metropolitan areas in Ontario, Quebec and British Columbia.

Although every attempt has been made to enumerate non-permanent residents, factors such as language difficulties and the reluctance to complete a government form or understand the need to participate may affect the enumeration of this population. Non permanent residents can only be identified through the long questionnaire completed by 20 per cent of Canadian households. The 1996 Census estimate of non-permanent residents wail not be known until the release of the immigration data in November 1997.

Appendix B. Geographic Units by Province and Territory, 1996 (as of November 1996)

Geographic unit	CANADA		Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
	1991	1996												
Federal electoral district (1987 RO*)	295	295	7	4	11	10	75	99	14	14	26	32	1	2
Federal electoral district (1996 RO*)	N/A	301	7	4	11	10	75	103	14	14	26	34	1	2
Economic region	68	74	4	1	5	5	16	11	8	6	8	8	1	1
Census division	290	288	10	3	18	15	99	49	23	18	19	28	1	5
Census division	73	73	10	–	–	–	3	–	23	18	19	–	–	–
Communauté urbaine	3	3	–	–	–	–	3	–	–	–	–	–	–	–
County	60	60	–	3	18	15	–	24	–	–	–	–	–	–
District	10	10	–	–	–	–	–	10	–	–	–	–	–	–
District municipality	1	1	–	–	–	–	–	1	–	–	–	–	–	–
Metropolitan municipality	1	1	–	–	–	–	–	1	–	–	–	–	–	–
Municipalité régionale de comté	93	93	–	–	–	–	93	–	–	–	–	–	–	–
Region	7	6	–	–	–	–	–	–	–	–	–	1	–	5
Regional district	29	27	–	–	–	–	–	–	–	–	–	27	–	–
Regional municipality	10	10	–	–	–	–	–	10	–	–	–	–	–	–
United counties	3	3	–	–	–	–	–	3	–	–	–	–	–	–
Territory	N/A	1	–	–	–	–	–	–	–	–	–	–	1	–
Census consolidated subdivision	2,630	2,607	87	68	52	148	1,143	518	128	302	73	82	1	5
Census subdivision[1]	6,006	5,984	381	113	110	283	1,599	947	298	970	467	713	35	68
Designated place (parts)	N/A	871	80	–	64	197	–	40	54	167	256	13	–	–
Census agricultural region	77	78	3	–	5	4	13	5	12	20	8	8	–	–
Census metropolitan area	25	25	1	–	1	1	6	10	1	2	2	2	–	–
Census agglomeration	115	112	4	2	4	5	27	32	3	7	9	21	1	1
Primary census metropolitan area	12	11	1	–	–	–	3	5	–	–	2	1	–	–
Primary census agglomeration	21	22	1	–	–	–	6	11	–	–	3	1	–	–
Census tract	4,068	4,223	41	–	75	69	1,108	1,799	158	99	386	488	–	–
Urban area	893	929	44	7	38	38	228	265	43	63	103	97	2	6
Enumeration area	45,995	49,361	1,236	267	1,511	1,393	11,684	16,469	2,050	2,844	4,746	6,880	111	170
Street network file (number of CSDs)	342	344	2	–	3	16	114	113	10	5	4	77	–	–
Block-face[2]	763,626	817,734	5,068	–	9,707	17,110	187,563	330,658	35,024	21,375	79,954	131,275	–	–
Forward sortation area[3]	1,368	1,477	32	7	58	44	383	515	63	45	137	187	3	5
Postal code[3]	652,826	680,910	7,073	2,737	18,864	16,144	175,885	244,909	22,821	20,778	64,530	105,801	864	504

Note: Underlined numbers indicate that those CMAs, CAs, PCMAs and urban areas crossing provincial boundaries are counted in both provinces.

* Representation Order

[1] For a list of census subdivision types, see Appendix C.

[2] Preliminary numbers.

[3] Counts derived from the December 1991 and from the July 1996 Postal Code Conversion File.

Appendix C. Census Subdivision Types by Province and Territory, 1996

		Total	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
Census subdivision type		5,984	381	113	110	283	1,599	947	298	970	467	713	35	68
BOR	Borough	1	–	–	–	–	–	1	–	–	–	–	–	–
C	City – Cité	145	3	2	2	7	2	51	5	13	15	43	1	1
CC	Chartered Community	2	–	–	–	–	–	–	–	–	–	–	–	2
CM	County (Municipality)	28	–	–	–	–	–	–	–	–	28	–	–	–
COM	Community	163	130	33	–	–	–	–	–	–	–	–	–	–
CT	Canton (Municipalité de)	88	–	–	–	–	88	–	–	–	–	–	–	–
CU	Cantons unis (Municipalité de)	8	–	–	–	–	8	–	–	–	–	–	–	–
DM	District Municipality	50	–	–	–	–	–	–	–	–	–	50	–	–
HAM	Hamlet	36	–	–	–	–	–	–	–	–	–	–	2	34
ID	Improvement District	10	–	–	–	–	–	2	–	–	8	–	–	–
IGD	Indian Government District	2	–	–	–	–	–	–	–	–	–	2	–	–
LGD	Local Government District	21	–	–	–	–	–	–	21	–	–	–	–	–
LOT	Township and Royalty	67	–	67	–	–	–	–	–	–	–	–	–	–
M	Municipalité	557	–	–	–	–	557	–	–	–	–	–	–	–
MD	Municipal District	49	–	–	12	–	–	–	–	–	37	–	–	–
NH	Northern Hamlet	12	–	–	–	–	–	–	–	12	–	–	–	–
NT	Northern Town	2	–	–	–	–	–	–	–	2	–	–	–	–
NV	Northern Village	13	–	–	–	–	–	–	–	13	–	–	–	–
P	Paroisse (Municipalité de)	344	–	–	–	–	344	–	–	–	–	–	–	–
PAR	Parish	152	–	–	–	152	–	–	–	–	–	–	–	–
R	Indian Reserve – Réserve indienne	996	1	4	24	19	30	140	77	120	88	487	4	2
RC	Rural Community	1	–	–	–	1	–	–	–	–	–	–	–	–
RGM	Regional Municipality	1	–	–	1	–	–	–	–	–	–	–	–	–
RM	Rural Municipality	404	–	–	–	–	–	–	106	298	–	–	–	–
RV	Resort Village	42	–	–	–	–	–	–	–	42	–	–	–	–
S-E	Indian Settlement – Établissement indien	33	–	–	–	–	5	10	4	1	4	3	6	–
SA	Special Area	3	–	–	–	–	–	–	–	–	3	–	–	–
SCM	Subdivision of County Municipality	38	–	–	38	–	–	–	–	–	–	–	–	–
SET	Settlement	31	–	–	–	–	–	–	–	–	–	–	13	18
SM	Specialized Municipality	2	–	–	–	–	–	–	–	–	2	–	–	–
SRD	Subdivision of Regional District	71	–	–	–	–	–	–	–	–	–	71	–	–
SUN	Subdivision of Unorganized	91	91	–	–	–	–	–	–	–	–	–	–	–
SV	Summer Village	54	–	–	–	–	–	–	–	–	54	–	–	–
T	Town	685	156	7	33	28	–	147	36	145	111	14	3	5
TI	Terre inuite	10	–	–	–	–	10	–	–	–	–	–	–	–
TP	Township	468	–	–	–	–	–	468	–	–	–	–	–	–
TR	Terres réservées	9	–	–	–	–	9	–	–	–	–	–	–	–
UNO	Unorganized – Non organisé	152	–	–	–	–	112	20	11	2	–	–	2	5
V	Ville	257	–	–	–	–	257	–	–	–	–	–	–	–
VC	Village cri	8	–	–	–	–	8	–	–	–	–	–	–	–
VK	Village naskapi	1	–	–	–	–	1	–	–	–	–	–	–	–
VL	Village	863	–	–	–	76	154	108	38	322	117	43	4	1
VN	Village nordique	14	–	–	–	–	14	–	–	–	–	–	–	–

References

Statistics Canada, [1992]

Policy Manual, Policy on Informing Users of Data Quality and Methodology, Statistics Canada, April 7, 1992.

Statistics Canada, [1997]

A National Overview. Ottawa: Industry Canada, 1997. 1996 Census of Canada. Catalogue number 93-357-XPB.

Statistics Canada, [1997]

1996 Census Dictionary. Ottawa: Industry Canada, 1997. 1996 Census of Canada. Catalogue number 92-351-XPE.

Statistics Canada, [1997]

Large Urban Enumeration Area Reference Maps. Ottawa: Industry Canada, 1997. 1996 Census of Canada. Catalogue number 92X0090XPB.

Statistics Canada, [1997]

Standard Geographical Classification, Volume I. Ottawa: Industry Canada, 1997. 1996 Census of Canada. Catalogue number 12-571-XPB.

Limited Use Data Product Licence Agreement

The Government of Canada (Statistics Canada) is the owner or a licensee of all intellectual property rights (including copyright) in this data product. In consideration of your payment of the requisite fee, you or your organization, as the case may be, (hereinafter referred to as the "licensee") are granted a non-exclusive, non-assignable and non-transferable licence to use this data product subject to the terms below.

This licence is not a sale of any or all of the rights of the owner(s). This data product may be used only by you or your organization, as the case may be. No part of the data product nor any right granted under this agreement shall be sold, rented, leased, lent, sub-licensed or transferred to any other person or organization. The licensee shall not use any part of the data product to develop or derive any other data product or data service for distribution or commercial sale, without a licence to do so. The licensee may not disassemble, decompile or in any way attempt to reverse engineer any software provided as part of the data product.

The licensee may not transfer this data product to or store the data product in any electronic network for use by more than one user unless it obtains prior written permission from Statistics Canada and pays any additional fees.

This data product is provided "as-is", and Statistics Canada makes no warranty, either express or implied, including but not limited to, warranties of merchantability and fitness for a particular purpose. In no event will Statistics Canada be liable for any indirect, special, consequential or other damages however caused.

This agreement will terminate automatically without notice if the licensee fails to comply with any term of this agreement. In the event of termination, the licensee must immediately return the data product to Statistics Canada or destroy it and certify this destruction in writing to Statistics Canada.

It is YOUR RESPONSIBILITY to ensure that your use of this data product complies with these terms and to seek prior written permission from Statistics Canada for any uses not permitted or not specified in this agreement.

ANY USE WHATSOEVER OF THIS DATA PRODUCT SHALL CONSTITUTE YOUR ACCEPTANCE OF THE TERMS OF THIS AGREEMENT.

For further information please contact:

Licence Services Tel: 613-951-8211

Marketing Division Fax: 613-951-1134

Statistics Canada

Ottawa, Ontario

Canada, K1A 0T6

Revised 12/11/96